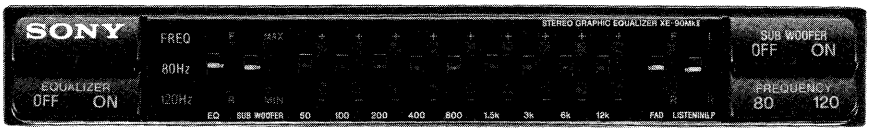
XE-90MkII

SERVICE MANUAL

US Model
Canadian Model
AEP Model
E Model



SPECIFICATIONS

Center frequencies
50 Hz, 100 Hz, 200 Hz,
400 Hz, 800 Hz, 1.5 kHz,
3 kHz, 6 kHz, 12 kHz
Boost/cut range ±12 dB
Sub-woofer cut-off frequency
80 Hz, 120 Hz (at −3 dB)
Output gain: −∞ to +8 dB
(cut-off slope −12 dB/oct)
Frequency response
5 Hz − 100 kHz $^{+0}_{-3}$dB
Signal-to-noise ratio
More than 105 dB
(A-weighted)
Harmonic distortion (at 1 kHz)
Less than 0.005%
Gain 0 dB

General

Input Line inputs (phono jacks)
×1
Output Line outputs (phono jacks)
×3
Power requirements
12 V DC car battery
(negative ground)
Current drain 300 mA
Input remote current
4 mA
Mounting dimensions
178 × 25 × 135 mm (w/h/d)
($7^1/_8 \times 1 \times 5^3/_8$ inches)
Weight Approx. 650 g (1 lb 7 oz)
Accessories supplied
Mounting hardware (1 set)
Connecting cord (1 set)

FUSE REPLACEMENT

If the fuse blows, check the power connection and replace the fuse. If the fuse blows again after replacement, there may be an internal malfunction. In this case, consult your nearest Sony dealer.

Warning
Use the specified ampere fuse. Use of a higher amperage fuse may cause serious damage.

STEREO GRAPHIC EQUALIZER

SONY®

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Flexible Circuit Board Repairing

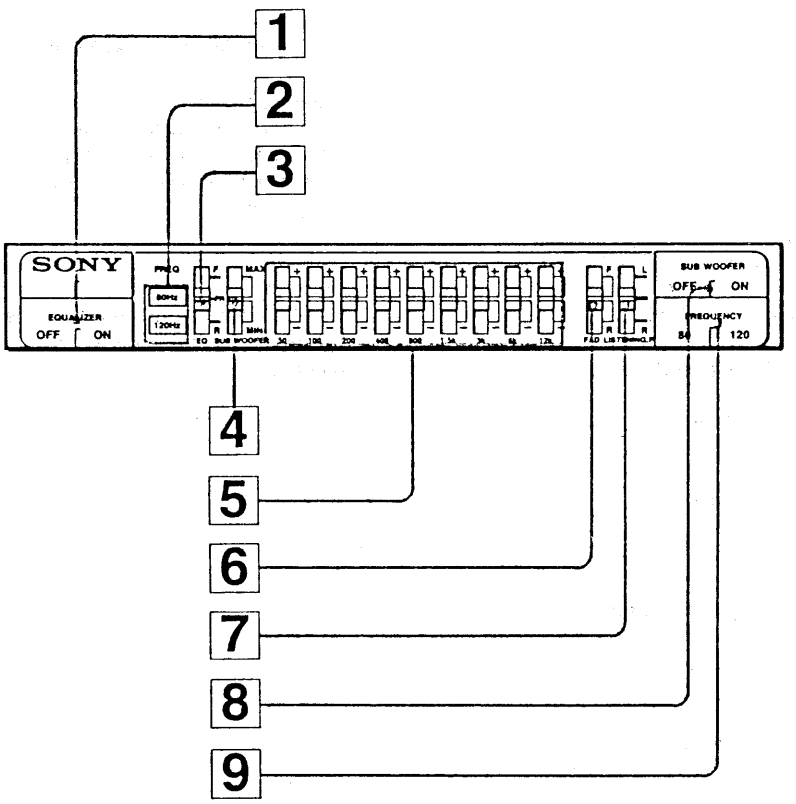
- Keep the temperature of the soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

SECTION 1
GENERAL

PARTS IDENTIFICATION



1 EQUALIZER ON/OFF button
2 FREQ (sub-woofer cut-off frequency) indicators
3 EQ (adjusting channel) selector and indicator
4 SUB WOOFER (sub-woofer level) control and indicator
5 Equalizer controls and indicators
6 FAD (fader) control and indicator
7 LISTENING P. (listening position) selector and indicator
8 SUB WOOFER ON/OFF button
9 FREQUENCY 80/120 (sub-woofer cut-off frequency) button

CONNECTIONS

Caution

- This unit is designed for negative ground 12 V DC operation only.
- Before making connections, disconnect the ground terminal of the car battery to avoid short circuits.
- Connect the yellow power input lead only after all other leads are connected. And be sure to connect it to the positive 12 V power terminal.
- **Run all ground wires to a common ground point.**

Note on amplifier and program source connection

The red jacks of the XE-8MkII/90MkII are for the right-channel connection and the white jacks for the left-channel.

When the sound level seems high

When using source equipment of manufacturers other than Sony, adjust the output level of this equalizer by setting the LEVEL switch to LOW.
Be sure to set it to SONY STD when using Sony source equipment.

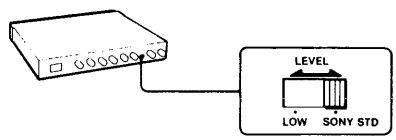
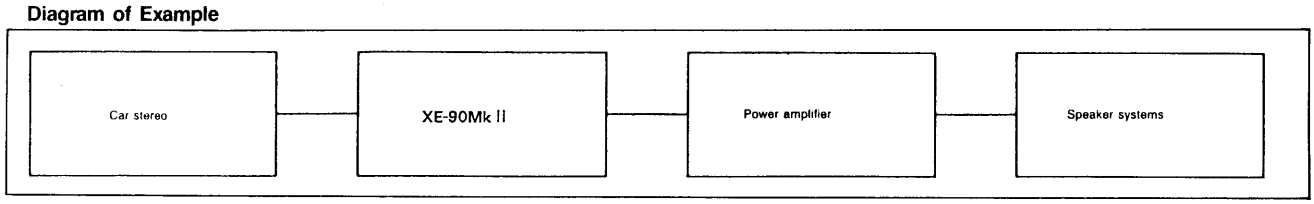
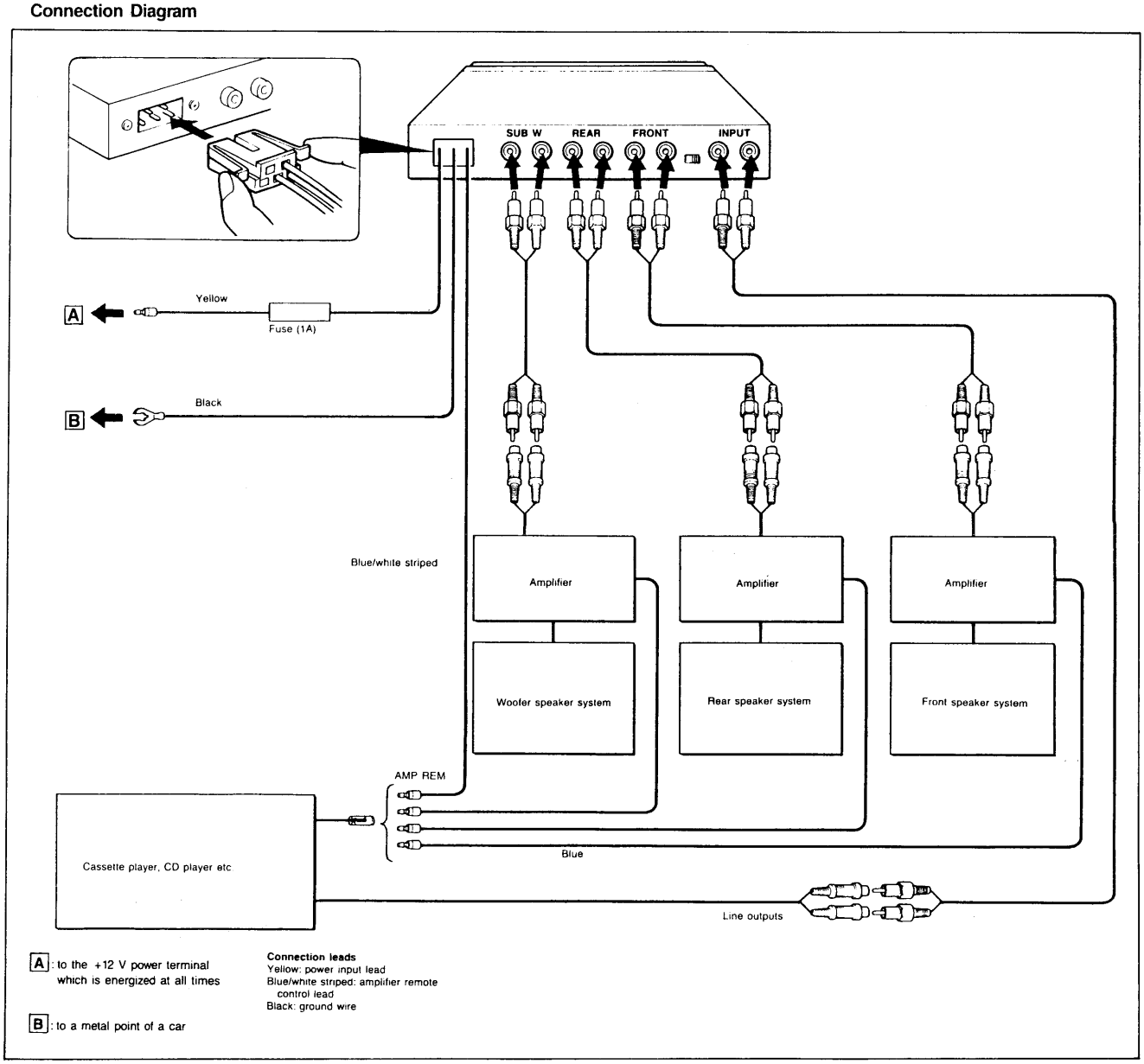


Diagram of Example



Connection Diagram



A : to the +12 V power terminal which is energized at all times

B : to a metal point of a car

Connection leads
Yellow: power input lead
Blue/white striped: amplifier remote control lead
Black: ground wire

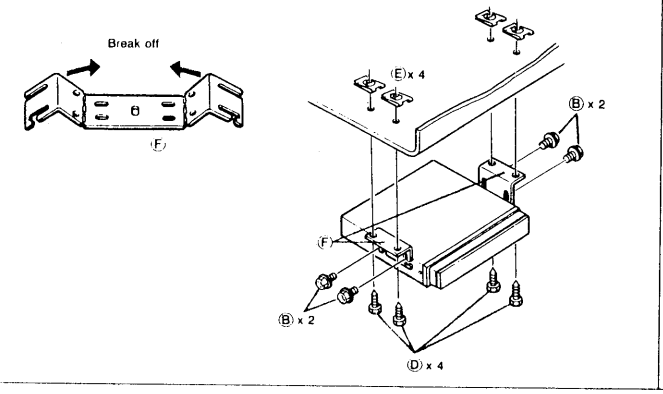
INSTALLATION

Precautions

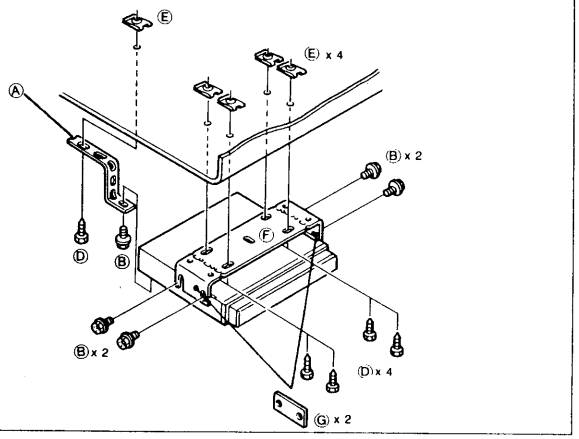
- Choose the mounting location carefully so that the unit will not interfere with the normal driving functions of the driver.
- Avoid installing the unit where it would be subject to high temperatures, such as from direct sunlight or from hot air from the heater, or where it would be subject to dust, dirt or excessive vibration.
- Use only the supplied mounting hardware for a safe and secure installation.

Mounting Example

Example 1



Example 2



Use the supplied mounting hardware.

1 Mark the locations of the holes on the bottom of the dashboard using the part Ⓕ as a template.

2 Drill 3 mm bolt holes.

3 Secure the pieces of part Ⓕ which are broken off to the bottom of the dashboard*.

4 Secure the unit to part Ⓕ.

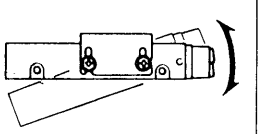
* If the dashboard or the firewall is thin or made of plastic or a similar material, secure the unit with tapping screws and tinnerman clips Ⓔ. If it is made of metal plate, the tinnerman clips are not necessary.

The unit can be installed inside the dashboard using an optional in-dash installation kit.

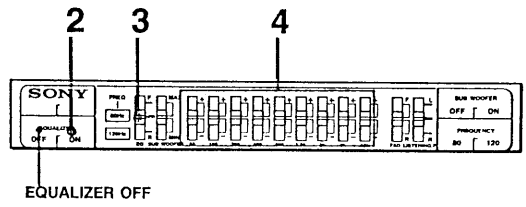
Notes

- Be sure to use the supplied bolts Ⓑ for mounting part Ⓕ on the unit. Longer bolts will damage the unit.
- Be careful not to damage wiring or equipment on the other side of the firewall.

The mounting position, height and angle can be adjusted as illustrated below.



COMPENSATING FOR THE SOUND



1 **Operate the car stereo.**

2 **Press the EQUALIZER ON button.**
The indicators on the equalizer controls light up.

3 **Select the speaker system** to be equalized.

	EQ selector position
To equalize only the sound from front speakers	F (front)
To equalize only the sound from rear speakers	R (rear)
To equalize the sound from both front and rear speakers	FR (front and rear)

If your system is 2-speaker system, set the EQ selector to FR.

4 **Adjust the equalizer controls.**
The sound will be compensated for.

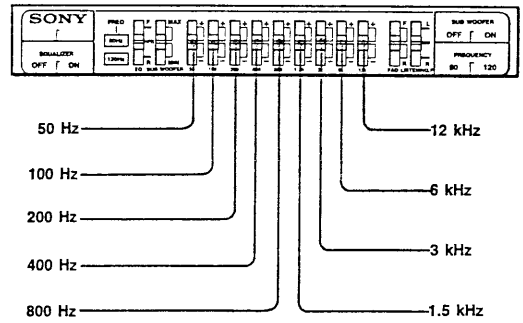
To restore to the original sound characteristics
Press the EQUALIZER OFF button.
You can compare the equalized sound with the original one.

Note
The EQ selector must be set to exactly at one of the three positions upper (F), center (FR), lower (R); otherwise equalizing effect cannot be obtained.

If no sound comes from the speakers of 2-speaker system
Check to see that the FAD (fader) control is set to the center position.

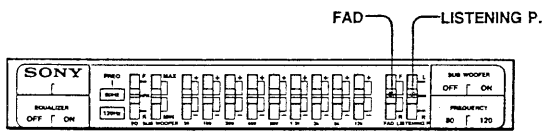
FOR BETTER SOUND COMPENSATION

First set all controls at their center position, and then slide the control of the frequency band to be compensated gradually upwards or downwards until you perceive an apparent improvement.



50 Hz	Boosts or cuts heavy bass. By cutting, the resonance with the car body can be reduced.
100 Hz	Boosts or cuts normal bass in a piece of music.
200 Hz	Governs the low-middle range and greatly influences the overall characteristics of the the sound. By cutting this range, clearness of a sound will be increased.
400 Hz	Provides warmth for the human voice and instrumental music.
800 Hz	Provides more presence for vocals.
1.5 kHz	Obtains a brighter brass sound or reduces stridency.
3 kHz	Provides brightness for a sound.
6 kHz	Provides a smoother sound for violin and other music.
12 kHz	Affects the general atmosphere.

ADJUSTING THE SOUND BALANCE



Adjusting the balance between the front and rear speakers

	FAD control setting
To adjust to the same level between the front and rear speakers	Center
To reduce the volume of the rear speakers	Move toward F.
To reduce the volume of the front speakers	Move toward R.

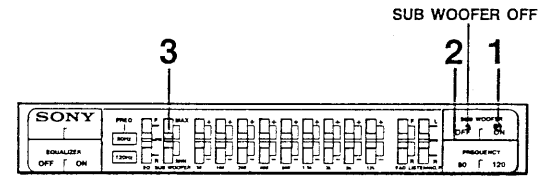
If your system is 2-speaker system, set the FAD control to the center position.

Shifting the stereo image according to the listener's position

	LISTENING P. selector position
To shift the stereo image to the center	Center
To shift the stereo image to the left	L
To shift the stereo image to the right	R

BOOSTING THE BASS SOUND

Bass sound from the speakers connected to the SUB W. (sub-woofer) outputs can be boosted by cutting off the frequencies higher than 80 Hz or 120 Hz.



1 **Press the SUB WOOFER ON button.**
The indicator on the SUB WOOFER control and one of the FREQ indicators light up.

2 **Press the FREQUENCY 80/120 button to select the frequency to be boosted.**

To reinforce the heavy bass sound	Press 80.
To reinforce the normal bass sound	Press 120.

The selected frequency indicator lights up.

3 **Adjust the sub-woofer sound level with the SUB WOOFER control.**

To restore to the original sound level
Press the SUB WOOFER OFF button.

SECTION 2
DIAGRAMS

• SEMICONDUCTOR LEAD LAYOUTS

2SA1150

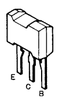
2SA1282-F

DSA1A2

2SA1175-HFE
2SC2785-HFE
2SD1020

HZ2ALL
HZ3BLL

2SA1428-Y



2SA1525
2SC3623A-K
DTA144ES
DTC143TS
DTC144ES

1SS119
RD6.8ES-B2
RD8.2ES-B1

2SB1094-L

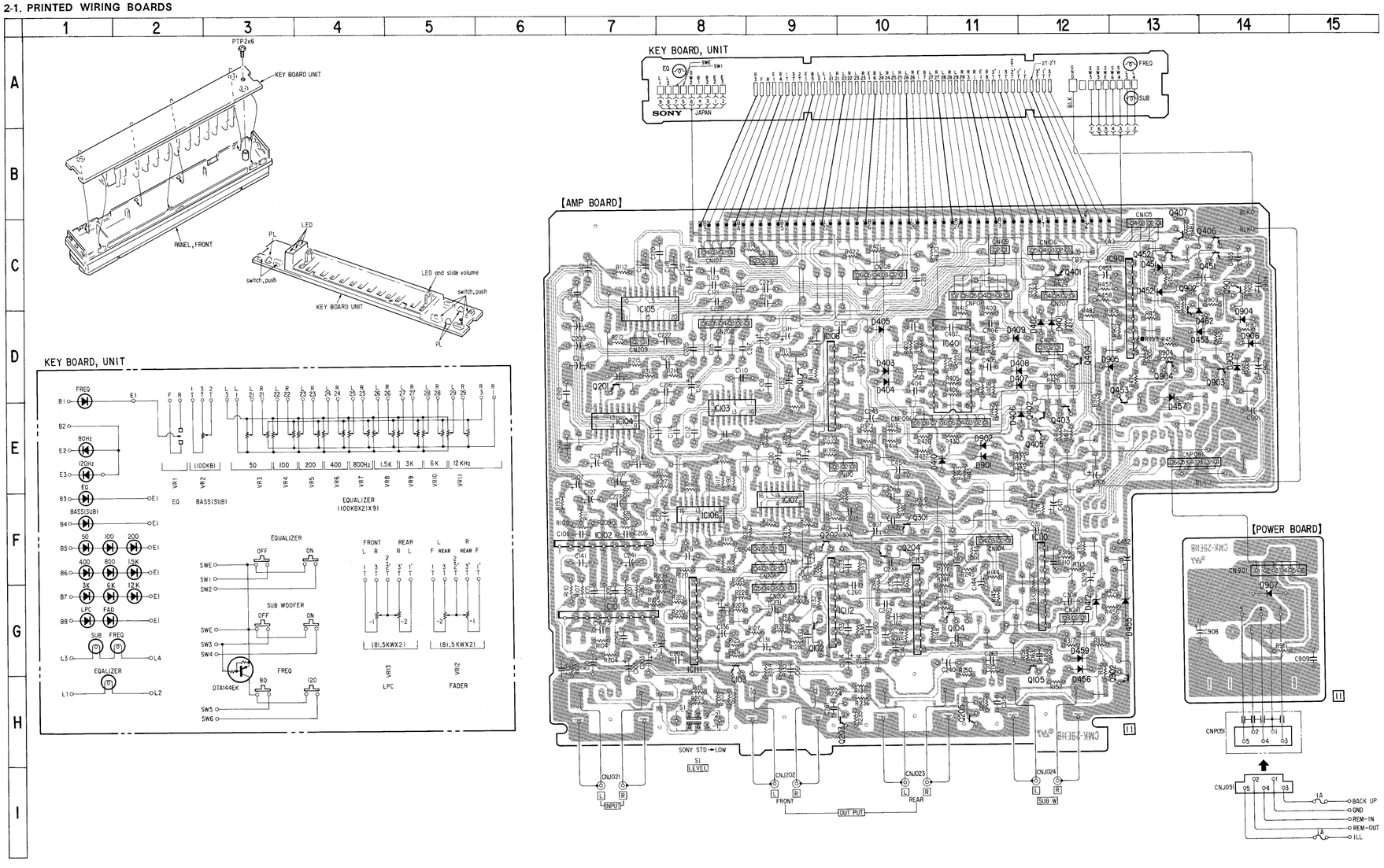
• SEMICONDUCTOR LOCATION

Ref. No.	Location	Ref. No.	Location
IC101	G-7	Q452	C-13
IC102	F-7	Q453	D-12
IC103	E-8	Q901	C-14
IC104	E-7	Q902	C-13
IC105	C-7	Q903	D-13
		Q904	D-13
IC106	F-8		
IC107	F-9		
IC108	D-9	D401	D-12
IC110	F-12	D402	D-12
IC111	G-8	D403	D-10
		D404	D-10
IC112	G-9	D405	D-10
IC113	G-10		
IC401	D-11	D406	E-11
IC901	C-13	D407	D-11
		D408	D-11
		D409	D-11
Q101	D-9	D410	E-10
Q102	G-9		
Q103	G-8	D412	G-12
Q104	G-11	D451	C-13
Q105	G-11	D452	C-13
		D453	D-13
Q201	D-7	D455	G-12
Q202	F-9		
Q203	H-9	D456	G-12
Q204	F-10	D457	E-13
Q205	H-11	D459	G-12
		D462	D-13
Q301	F-10	D901	E-11
Q302	H-12		
Q401	C-12	D902	E-11
Q402	E-12	D903	D-14
Q403	E-12	D904	D-14
		D905	D-12
Q404	D-12	D906	D-14
Q405	E-12	D907	G-14
Q406	C-13		
Q407	C-13		
Q451	C-13		

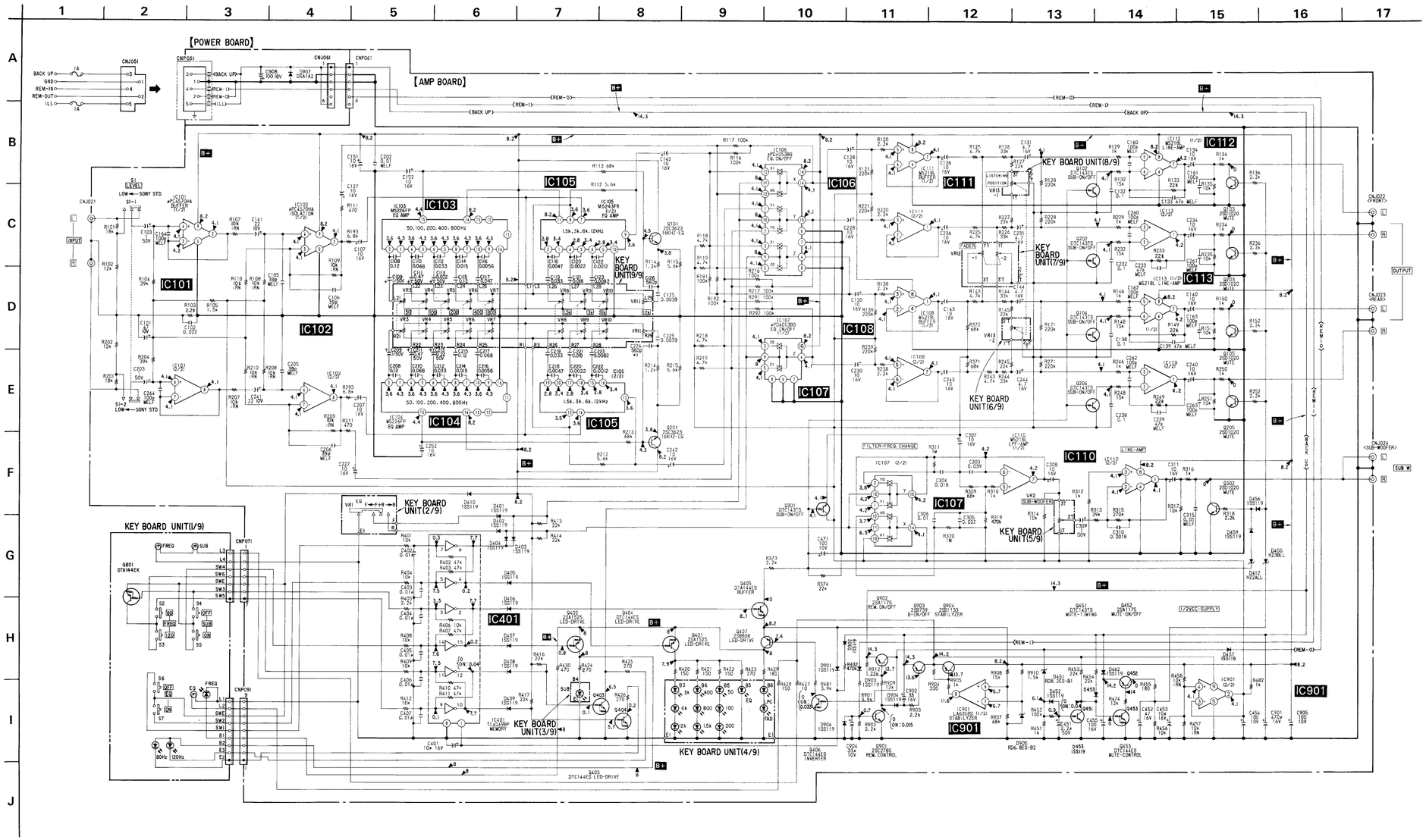
Note :

- ○— : parts extracted from the component side.
- ●— : parts extracted from the conductor side.
- ▒▒ : Pattern on the side which is seen.

2-1. PRINTED WIRING BOARDS

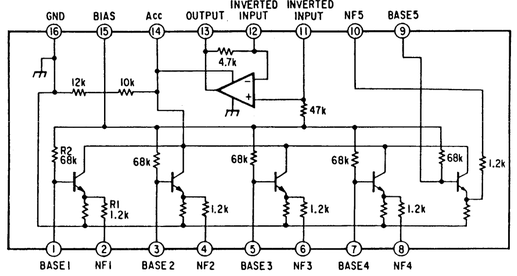


2-2. SCHEMATIC DIAGRAM

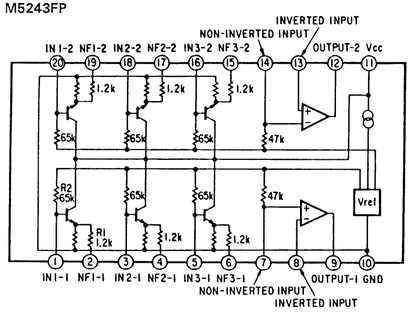


• IC BLOCK DIAGRAMS

M5226FP



M5243FP



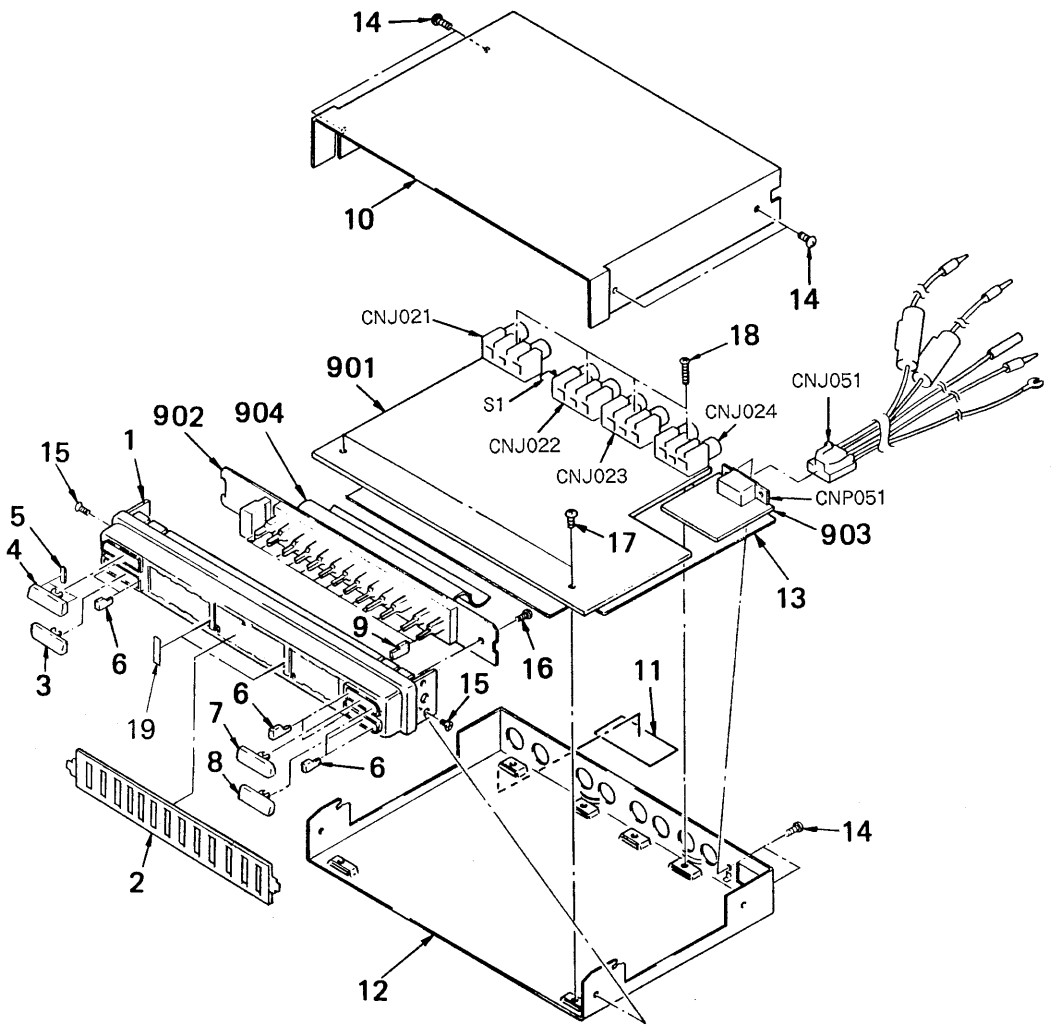
Note :

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- Voltages are taken with a VOM (50kΩ/V). Voltage variations may be noted due to normal production tolerances.
- B+ : B+ Line

SECTION 3
EXPLODED VIEW

NOTE:

- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- Due to standardization, parts with part number suffix -XX and -X may be different from the parts specified in the components used on the set.
- Color Indication of Appearance Parts
  Example:
  (RED) ... KNOB, BALANCE (WHITE)
  ↑ ↑
  Cabinet's Color Parts' Color



No.	Part No.	Description	Remarks
1	3-346-810-21	PLATE, INDICATION	
2	3-346-814-11	PANEL, FRONT	
3	3-346-813-21	BUTTON (EQ)	
4	3-342-406-21	BUTTON, S	
5	*3-346-825-01	SHEET (D)	
6	3-339-904-01	SLIDER	
7	3-346-812-41	BUTTON (SUB WOOFER)	
8	3-346-809-21	BUTTON (FREQ)	
9	3-346-811-01	KNOB (EQ)	
10	*3-342-450-01	COVER	
11	*3-346-818-01	(US,AEP,E)...LABEL, MODEL NUMBER	
	*3-346-819-01	(Canadian)...LABEL, MODEL NUMBER	
12	*3-342-451-02	CASE (LOWER)	
13	*3-346-815-01	SHEET (B)	
14	7-682-544-09	SCREW +B 3X3	
15	7-621-559-20	SCREW +K 2.6X4	
16	7-685-104-19	SCREW +P 2×6 TYPE2 NON-SLIT	

No.	Part No.	Description	Remarks
17	7-621-775-10	SCREW +B 2.6X4	
18	7-621-255-85	SCREW +P 2X14	
19	*3-346-816-01	SHEET (A)	
901	*A-3279-975-A	MOUNTED PCB, AMPLIFIER	
902	1-464-966-21	KEY BOARD, UNIT	
903	1-626-509-11	PC BOARD, POWER	
904	1-626-846-11	PC BOARD, INTERFACE FLEXIBLE	
CNJ021	1-565-412-11	JACK, PIN 2P (INPUT)	
CNJ022	1-565-412-11	JACK, PIN 2P (OUTPUT)	
CNJ023	1-565-412-11	JACK, PIN 2P (OUTPUT)	
CNJ024	1-565-412-11	JACK, PIN 2P (SUB W)	
CNJ051	1-575-687-11	CORD (WITH CONNECTOR)	
CNP051	*1-566-624-31	CONNECTOR 5P	
S1	1-570-875-11	SWITCH, SLIDE (LEVEL)	

SECTION 4
ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- Items marked "★" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- If there are two or more same circuits in a set such as a stereophonic machine, only typical circuit parts may be indicated and capacitors and resistors in other same circuits may be omitted.

CAPACITORS:
MF: μF, PF: μμF.

RESISTORS
- All resistors are in ohms.
- F: nonflammable

COILS
- MMH: mH, UH: μH

SEMICONDUCTORS
In each case, U: μ, for example:
UA...: μA..., UPA...: μPA...,
UPC...: μPC, UPD...: μPD...

Ref.No.	Part No.	Description			
901	*A-3279-975-A	MOUNTED PCB, AMPLIFIER			
902	1-464-966-21	KEY BOARD, UNIT			
903	1-626-509-11	PC BOARD, POWER			
904	1-626-846-11	PC BOARD, INTERFACE FLEXIBLE			
C101	1-126-276-11	ELECT	47MF	20%	10V
C102	1-130-487-00	FILM	0.022MF	5%	50V
C103	1-126-301-11	ELECT	1MF	20%	50V
C105	1-163-171-00	CERAMIC MELF	39PF	5%	50V
C106	1-163-171-00	CERAMIC MELF	39PF	5%	50V
C107	1-126-282-11	ELECT	10MF	20%	16V
C108	1-136-837-11	FILM	0.12MF	5%	50V
C109	1-126-301-11	ELECT	1MF	20%	50V
C110	1-136-741-11	FILM	0.068MF	5%	50V
C111	1-126-300-11	ELECT	0.47MF	20%	50V
C112	1-130-489-00	FILM	0.033MF	5%	50V
C113	1-126-298-11	ELECT	0.22MF	20%	50V
C114	1-130-485-00	FILM	0.015MF	5%	50V
C115	1-136-837-11	FILM	0.12MF	5%	50V
C116	1-130-480-00	FILM	0.0056MF	5%	50V
C117	1-136-741-11	FILM	0.068MF	5%	50V
C118	1-130-479-00	FILM	0.0047MF	5%	50V
C119	1-130-489-00	FILM	0.033MF	5%	50V
C120	1-130-475-00	FILM	0.0022MF	5%	50V
C121	1-130-486-00	FILM	0.018MF	5%	50V
C122	1-130-472-00	FILM	0.0012MF	5%	50V
C123	1-130-482-00	FILM	0.0082MF	5%	50V
C125	1-130-478-00	FILM	0.0039MF	5%	50V
C126	1-130-468-00	FILM	560PF	5%	50V
C127	1-126-282-11	ELECT	10MF	20%	16V
C128	1-126-282-11	ELECT	10MF	20%	16V
C130	1-126-282-11	ELECT	10MF	20%	16V
C131	1-126-281-11	ELECT	4.7MF	20%	16V
C132	1-136-742-11	FILM	0.1MF	5%	50V
C133	1-163-173-00	CERAMIC MELF	47PF	5%	50V
C134	1-126-282-11	ELECT	10MF	20%	16V
C136	1-126-282-11	ELECT	10MF	20%	16V
C138	1-136-742-11	FILM	0.1MF	5%	50V
C139	1-163-173-00	CERAMIC MELF	47PF	5%	50V
C140	1-126-282-11	ELECT	10MF	20%	16V
C141	1-126-274-11	ELECT	22MF	20%	10V
C142	1-126-282-11	ELECT	10MF	20%	16V
C143	1-126-282-11	ELECT	10MF	20%	16V
C144	1-126-281-11	ELECT	4.7MF	20%	16V
C151	1-126-282-11	ELECT	10MF	20%	16V
C152	1-126-282-11	ELECT	10MF	20%	16V
C160	1-163-181-00	CERAMIC MELF	100PF	10%	50V

Ref.No.	Part No.	Description			
C161	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C162	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C163	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C164	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C202	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V
C203	1-126-301-11	ELECT	1MF	20%	50V
C205	1-163-171-00	CERAMIC MELF	39PF	5%	50V
C206	1-163-171-00	CERAMIC MELF	39PF	5%	50V
C207	1-126-282-11	ELECT	10MF	20%	16V
C208	1-136-837-11	FILM	0.12MF	5%	50V
C209	1-126-301-11	ELECT	1MF	20%	50V
C210	1-136-741-11	FILM	0.068MF	5%	50V
C211	1-126-300-11	ELECT	0.47MF	20%	50V
C212	1-130-489-00	FILM	0.033MF	5%	50V
C213	1-126-298-11	ELECT	0.22MF	20%	50V
C214	1-130-485-00	FILM	0.015MF	5%	50V
C215	1-136-837-11	FILM	0.12MF	5%	50V
C216	1-130-480-00	FILM	0.0056MF	5%	50V
C217	1-136-741-11	FILM	0.068MF	5%	50V
C218	1-130-479-00	FILM	0.0047MF	5%	50V
C219	1-130-489-00	FILM	0.033MF	5%	50V
C220	1-130-475-00	FILM	0.0022MF	5%	50V
C221	1-130-486-00	FILM	0.018MF	5%	50V
C222	1-130-472-00	FILM	0.0012MF	5%	50V
C223	1-130-482-00	FILM	0.0082MF	5%	50V
C225	1-130-478-00	FILM	0.0039MF	5%	50V
C226	1-130-468-00	FILM	560PF	5%	50V
C227	1-126-282-11	ELECT	10MF	20%	16V
C228	1-126-282-11	ELECT	10MF	20%	16V
C230	1-126-282-11	ELECT	10MF	20%	16V
C231	1-126-281-11	ELECT	4.7MF	20%	16V
C232	1-136-742-11	FILM	0.1MF	5%	50V
C233	1-163-173-00	CERAMIC MELF	47PF	5%	50V
C234	1-126-282-11	ELECT	10MF	20%	16V
C236	1-126-282-11	ELECT	10MF	20%	16V
C238	1-136-742-11	FILM	0.1MF	5%	50V
C239	1-163-173-00	CERAMIC MELF	47PF	5%	50V
C240	1-126-282-11	ELECT	10MF	20%	16V
C241	1-126-274-11	ELECT	22MF	20%	10V
C242	1-126-282-11	ELECT	10MF	20%	16V
C243	1-126-282-11	ELECT	10MF	20%	16V
C244	1-126-281-11	ELECT	4.7MF	20%	16V
C252	1-126-282-11	ELECT	10MF	20%	16V
C260	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C261	1-163-181-00	CERAMIC MELF	100PF	10%	50V

Ref.No.	Part No.	Description			
C262	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C263	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C264	1-163-181-00	CERAMIC MELF	100PF	10%	50V
C303	1-130-490-11	FILM	0.039MF	5%	50V
C304	1-130-486-00	FILM	0.018MF	5%	50V
C305	1-130-487-00	FILM	0.022MF	5%	50V
C306	1-130-483-00	FILM	0.01MF	5%	50V
C307	1-126-282-11	ELECT	10MF	20%	16V
C308	1-126-282-11	ELECT	10MF	20%	16V
C309	1-126-301-11	ELECT	1MF	20%	50V
C310	1-136-374-91	FILM	0.0018MF	5%	50V
C311	1-126-282-11	ELECT	10MF	20%	16V
C315	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V
C401	1-126-282-11	ELECT	10MF	20%	16V
C402	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V
C403	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V
C404	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V
C405	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V
C406	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V
C407	1-163-059-00	CERAMIC MELF	0.01MF	30%	16V
C451	1-126-302-11	ELECT	2.2MF	20%	50V
C452	1-124-589-11	ELECT	47MF	20%	16V
C453	1-126-282-11	ELECT	10MF	20%	16V
C454	1-124-584-00	ELECT	100MF	20%	10V
C455	1-126-101-11	ELECT	100MF	20%	16V
C471	1-124-584-00	ELECT	100MF	20%	10V
C901	1-126-103-11	ELECT	470MF	20%	16V
C902	1-124-963-11	ELECT	33MF	20%	16V
C904	1-124-229-00	ELECT	33MF	20%	10V
C905	1-124-584-00	ELECT	100MF	20%	10V
C908	1-126-101-11	ELECT	100MF	20%	16V
CNJ021	1-565-412-11	JACK, PIN 2P (INPUT)			
CNJ022	1-565-412-11	JACK, PIN 2P (OUTPUT)			
CNJ023	1-565-412-11	JACK, PIN 2P (OUTPUT)			
CNJ024	1-565-412-11	JACK, PIN 2P (SUB W)			
CNJ051	1-575-687-11	CORD (WITH CONNECTOR)			
CNP051*	1-566-624-31	CONNECTOR 5P			
CNP071*	1-506-989-11	PIN, CONNECTOR (PC BOARD) 7P			
CNP091*	1-506-991-11	PIN, CONNECTOR (PC BOARD) 9P			
D401	8-719-911-19	DIODE 1SS119			
D402	8-719-911-19	DIODE 1SS119			
D403	8-719-911-19	DIODE 1SS119			
D404	8-719-911-19	DIODE 1SS119			
D405	8-719-911-19	DIODE 1SS119			
D406	8-719-911-19	DIODE 1SS119			
D407	8-719-911-19	DIODE 1SS119			
D408	8-719-911-19	DIODE 1SS119			
D409	8-719-911-19	DIODE 1SS119			
D410	8-719-911-19	DIODE 1SS119			
D412	8-719-921-11	DIODE HZ2ALL			
D451	8-719-110-06	DIODE RD8.2ES-B1			
D452	8-719-911-19	DIODE 1SS119			
D453	8-719-911-19	DIODE 1SS119			
D455	8-719-942-32	DIODE HZ3BLL			
D456	8-719-911-19	DIODE 1SS119			
D457	8-719-911-19	DIODE 1SS119			
D459	8-719-911-19	DIODE 1SS119			
D462	8-719-911-19	DIODE 1SS119			

Ref.No.	Part No.	Description			
D901	8-719-911-19	DIODE 1SS119			
D902	8-719-911-19	DIODE 1SS119			
D903	8-719-911-19	DIODE 1SS119			
D904	8-719-911-19	DIODE 1SS119			
D905	8-719-109-97	DIODE RD6.8ES-B2			
D906	8-719-911-19	DIODE 1SS119			
D907	8-719-928-26	DIODE DSA1A2			
IC101	8-759-710-73	IC NJM4580L			
IC102	8-759-710-73	IC NJM4580L			
IC103	8-759-630-99	IC M5226FP			
IC104	8-759-630-99	IC M5226FP			
IC105	8-759-630-91	IC M5243FP			
IC106	8-759-103-25	IC UPD4053BG			
IC107	8-759-103-25	IC UPD4053BG			
IC108	8-759-600-02	IC M5218L			
IC110	8-759-600-02	IC M5218L			
IC111	8-759-600-02	IC M5218L			
IC112	8-759-600-02	IC M5218L			
IC113	8-759-600-02	IC M5218L			
IC401	8-759-240-49	IC TC4049BP			
IC901	8-759-981-74	IC LM2904S			
Q101	8-729-107-84	TRANSISTOR 2SC3623A-K			
Q102	8-729-900-74	TRANSISTOR DTC143TS			
Q103	8-729-102-05	TRANSISTOR 2SD1020			
Q104	8-729-900-74	TRANSISTOR DTC143TS			
Q105	8-729-102-05	TRANSISTOR 2SD1020			
Q201	8-729-107-84	TRANSISTOR 2SC3623A-K			
Q202	8-729-900-74	TRANSISTOR DTC143TS			
Q203	8-729-102-05	TRANSISTOR 2SD1020			
Q204	8-729-900-74	TRANSISTOR DTC143TS			
Q205	8-729-102-05	TRANSISTOR 2SD1020			
Q301	8-729-900-74	TRANSISTOR DTC143TS			
Q302	8-729-102-05	TRANSISTOR 2SD1020			
Q401	8-729-820-09	TRANSISTOR 2SA1525			
Q402	8-729-820-09	TRANSISTOR 2SA1525			
Q403	8-729-900-89	TRANSISTOR DTC144ES			
Q404	8-729-900-89	TRANSISTOR DTC144ES			
Q405	8-729-900-65	TRANSISTOR DTA144ES			
Q406	8-729-900-89	TRANSISTOR DTC144ES			
Q407	8-729-800-81	TRANSISTOR 2SA1150			
Q451	8-729-900-74	TRANSISTOR DTC143TS			
Q452	8-729-119-76	TRANSISTOR 2SA1175-HFE			
Q453	8-729-900-89	TRANSISTOR DTC144ES			
Q901	8-729-119-78	TRANSISTOR 2SC2785-HFE			
Q902	8-729-205-95	TRANSISTOR 2SA1428-Y			
Q903	8-729-600-82	TRANSISTOR 2SA1282-F			
Q904	8-729-111-67	TRANSISTOR 2SB1094-L			
R101	1-249-432-11	CARBON MELF	18K	5%	1/5W
R102	1-249-430-11	CARBON MELF	12K	5%	1/5W
R103	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R104	1-249-436-11	CARBON MELF	39K	5%	1/5W
R105	1-249-419-11	CARBON MELF	1.5K	5%	1/5W
R107	1-215-445-00	METAL	10K	1%	1/6W
R108	1-215-445-00	METAL	10K	1%	1/6W
R109	1-215-445-00	METAL	10K	1%	1/6W
R110	1-215-445-00	METAL	10K	1%	1/6W

Ref.No.	Part No.	Description			
R111	1-249-413-11	CARBON MELF	470	5%	1/5W
R112	1-249-426-11	CARBON MELF	5.6K	5%	1/5W
R113	1-249-439-11	CARBON MELF	68K	5%	1/5W
R114	1-249-038-00	CARBON MELF	1.2K	5%	1/5W
R115	1-249-426-11	CARBON MELF	5.6K	5%	1/5W
R116	1-249-441-11	CARBON MELF	100K	5%	1/5W
R117	1-249-441-11	CARBON MELF	100K	5%	1/5W
R118	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R119	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R120	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R121	1-215-477-00	CARBON MELF	220K	5%	1/5W
R125	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R126	1-249-435-11	CARBON MELF	33K	5%	1/5W
R127	1-249-433-11	CARBON MELF	22K	5%	1/5W
R128	1-215-477-00	CARBON MELF	220K	5%	1/5W
R129	1-249-417-11	CARBON MELF	1K	5%	1/5W
R132	1-249-431-11	CARBON MELF	15K	5%	1/5W
R133	1-249-433-11	CARBON MELF	22K	5%	1/5W
R134	1-249-417-11	CARBON MELF	1K	5%	1/5W
R135	1-249-429-11	CARBON MELF	10K	5%	1/5W
R136	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R138	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R139	1-215-477-00	CARBON MELF	220K	5%	1/5W
R143	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R144	1-249-435-11	CARBON MELF	33K	5%	1/5W
R145	1-249-433-11	CARBON MELF	22K	5%	1/5W
R146	1-249-417-11	CARBON MELF	1K	5%	1/5W
R148	1-249-431-11	CARBON MELF	15K	5%	1/5W
R149	1-249-433-11	CARBON MELF	22K	5%	1/5W
R150	1-249-417-11	CARBON MELF	1K	5%	1/5W
R151	1-249-429-11	CARBON MELF	10K	5%	1/5W
R152	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R171	1-215-477-00	CARBON MELF	220K	5%	1/5W
R191	1-249-441-11	CARBON MELF	100K	5%	1/5W
R192	1-249-441-11	CARBON MELF	100K	5%	1/5W
R193	1-249-427-11	CARBON MELF	6.8K	5%	1/5W
R201	1-249-432-11	CARBON MELF	18K	5%	1/5W
R202	1-249-430-11	CARBON MELF	12K	5%	1/5W
R204	1-249-436-11	CARBON MELF	39K	5%	1/5W
R207	1-215-445-00	METAL	10K	1%	1/6W
R208	1-215-445-00	METAL	10K	1%	1/6W
R209	1-215-445-00	METAL	10K	1%	1/6W
R210	1-215-445-00	METAL	10K	1%	1/6W
R211	1-249-413-11	CARBON MELF	470	5%	1/5W
R212	1-249-426-11	CARBON MELF	5.6K	5%	1/5W
R213	1-249-439-11	CARBON MELF	68K	5%	1/5W
R214	1-249-038-00	CARBON MELF	1.2K	5%	1/5W
R215	1-249-426-11	CARBON MELF	5.6K	5%	1/5W
R216	1-249-441-11	CARBON MELF	100K	5%	1/5W
R217	1-249-441-11	CARBON MELF	100K	5%	1/5W
R218	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R219	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R220	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R221	1-215-477-00	CARBON MELF	220K	5%	1/5W
R225	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R226	1-249-435-11	CARBON MELF	33K	5%	1/5W
R227	1-249-433-11	CARBON MELF	22K	5%	1/5W

Ref.No.	Part No.	Description			
R228	1-215-477-00	CARBON MELF	220K	5%	1/5W
R229	1-249-417-11	CARBON MELF	1K	5%	1/5W
R232	1-249-431-11	CARBON MELF	15K	5%	1/5W
R233	1-249-433-11	CARBON MELF	22K	5%	1/5W
R234	1-249-417-11	CARBON MELF	1K	5%	1/5W
R235	1-249-429-11	CARBON MELF	10K	5%	1/5W
R236	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R238	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R239	1-215-477-00	CARBON MELF	220K	5%	1/5W
R243	1-249-425-11	CARBON MELF	4.7K	5%	1/5W
R244	1-249-435-11	CARBON MELF	33K	5%	1/5W
R245	1-249-433-11	CARBON MELF	22K	5%	1/5W
R246	1-249-417-11	CARBON MELF	1K	5%	1/5W
R248	1-249-431-11	CARBON MELF	15K	5%	1/5W
R249	1-249-433-11	CARBON MELF	22K	5%	1/5W
R250	1-249-417-11	CARBON MELF	1K	5%	1/5W
R251	1-249-429-11	CARBON MELF	10K	5%	1/5W
R252	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R271	1-215-477-00	CARBON MELF	220K	5%	1/5W
R291	1-249-441-11	CARBON MELF	100K	5%	1/5W
R292	1-249-441-11	CARBON MELF	100K	5%	1/5W
R293	1-249-427-11	CARBON MELF	6.8K	5%	1/5W
R309	1-249-439-11	CARBON MELF	68K	5%	1/5W
R310	1-249-417-11	CARBON MELF	1K	5%	1/5W
R311	1-215-493-00	CARBON MELF	1M	5%	1/5W
R312	1-249-417-11	CARBON MELF	1K	5%	1/5W
R313	1-249-436-11	CARBON MELF	39K	5%	1/5W
R314	1-249-429-11	CARBON MELF	10K	5%	1/5W
R315	1-215-477-00	CARBON MELF	220K	5%	1/5W
R316	1-249-417-11	CARBON MELF	1K	5%	1/5W
R317	1-249-429-11	CARBON MELF	10K	5%	1/5W
R318	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R319	1-215-485-00	CARBON MELF	470K	5%	1/5W
R320	1-215-493-00	CARBON MELF	1M	5%	1/5W
R371	1-249-439-11	CARBON MELF	68K	5%	1/5W
R372	1-249-439-11	CARBON MELF	68K	5%	1/5W
R373	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R374	1-249-433-11	CARBON MELF	22K	5%	1/5W
R401	1-249-429-11	CARBON MELF	10K	5%	1/5W
R402	1-249-437-11	CARBON MELF	47K	5%	1/5W
R403	1-249-437-11	CARBON MELF	47K	5%	1/5W
R404	1-249-429-11	CARBON MELF	10K	5%	1/5W
R405	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R406	1-249-429-11	CARBON MELF	10K	5%	1/5W
R407	1-249-437-11	CARBON MELF	47K	5%	1/5W
R408	1-249-429-11	CARBON MELF	10K	5%	1/5W
R409	1-249-429-11	CARBON MELF	10K	5%	1/5W
R410	1-249-437-11	CARBON MELF	47K	5%	1/5W
R411	1-249-437-11	CARBON MELF	47K	5%	1/5W
R412	1-249-429-11	CARBON MELF	10K	5%	1/5W
R413	1-249-433-11	CARBON MELF	22K	5%	1/5W
R414	1-249-433-11	CARBON MELF	22K	5%	1/5W
R416	1-249-433-11	CARBON MELF	22K	5%	1/5W
R417	1-249-433-11	CARBON MELF	22K	5%	1/5W
R420	1-249-407-11	CARBON MELF	150	5%	1/5W
R421	1-249-407-11	CARBON MELF	150	5%	1/5W
R422	1-249-407-11	CARBON MELF	150	5%	1/5W

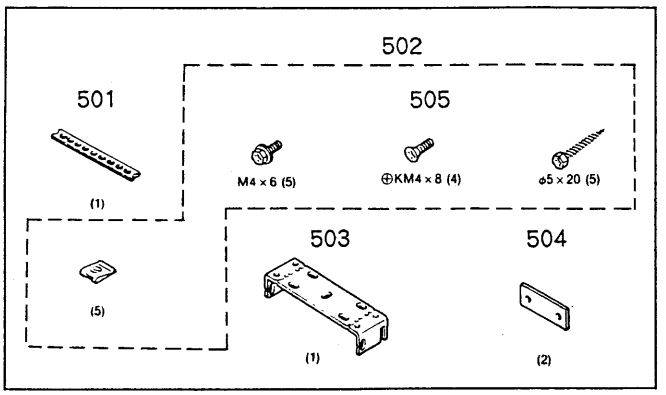
Ref.No.	Part No.	Description			
R423	1-249-410-11	CARBON MELF	270	5%	1/5W
R424	1-249-410-11	CARBON MELF	270	5%	1/5W
R425	1-249-410-11	CARBON MELF	270	5%	1/5W
R426	1-249-410-11	CARBON MELF	270	5%	1/5W
R427	1-249-393-11	CARBON MELF	10	5%	1/5W
R428	1-249-407-11	CARBON MELF	150	5%	1/5W
R429	1-249-408-11	CARBON MELF	180	5%	1/5W
R430	1-249-413-11	CARBON MELF	470	5%	1/5W
R432	1-215-485-00	CARBON MELF	470K	5%	1/5W
R451	1-249-417-11	CARBON MELF	1K	5%	1/5W
R452	1-249-441-11	CARBON MELF	100K	5%	1/5W
R453	1-249-433-11	CARBON MELF	22K	5%	1/5W
R454	1-249-433-11	CARBON	22K	5%	1/4W
R455	1-249-408-11	CARBON MELF	180	5%	1/5W
R456	1-249-429-11	CARBON MELF	10K	5%	1/5W
R457	1-249-429-11	CARBON	10K	5%	1/4W
R458	1-249-429-11	CARBON	10K	5%	1/4W
R474	1-249-430-11	CARBON MELF	12K	5%	1/5W
R481	1-249-424-11	CARBON MELF	3.9K	5%	1/5W
R482	1-249-417-11	CARBON MELF	1K	5%	1/5W
R901	1-249-424-11	CARBON MELF	3.9K	5%	1/5W
R902	1-249-417-11	CARBON MELF	1K	5%	1/5W
R903	1-249-421-11	CARBON MELF	2.2K	5%	1/5W
R904	1-249-411-11	CARBON MELF	330	5%	1/5W
R905	1-249-417-11	CARBON MELF	1K	5%	1/5W
R907	1-249-439-11	CARBON MELF	68K	5%	1/5W
R908	1-249-431-11	CARBON MELF	15K	5%	1/5W
R909	1-249-430-11	CARBON MELF	12K	5%	1/5W
R910	1-249-419-11	CARBON MELF	1.5K	5%	1/5W
R912	1-249-433-11	CARBON MELF	22K	5%	1/5W
R999	1-249-437-11	CARBON	47K	5%	1/4W
S1	1-570-875-11	SWITCH, SLIDE (LEVEL)			

ACCESSORY & PACKING MATERIAL

3-315-746-01	STOPPER (SMALL)
3-331-323-01	CUSHION (J)
3-336-617-01	BAG, PROTECTION
3-751-539-11	(AEP,E).....MANUAL, INSTRUCTION
3-751-539-21	(US,Canadian)...MANUAL, INSTRUCTION
3-751-539-41	(E).....MANUAL, INSTRUCTION
3-751-541-12	(AEP,E).....MANUAL, INSTRUCTION
3-751-541-21	(US,Canadian)...MANUAL, INSTRUCTION
3-751-541-41	(E).....MANUAL, INSTRUCTION
*3-346-821-01	INDIVIDUAL CARTON
*3-764-869-11	(E)...INSTRUCTION, DBP CAUTION

MOUTING HARDWRE

No.	Part No.	Description
501	3-310-655-01	SUPPORT (ND), FITTING
502	X-3315-702-1	SCREW ASSY (25MM), FITTING
503	3-315-736-21	BRACKET, NEW D
504	3-339-927-01	SPACER
505	7-682-261-09	SCREW +K 4X8



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